

Exhibit 1



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Basir

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(54) **VEHICLE IMMERSIVE COMMUNICATION SYSTEM**

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See application file for complete search history.

(56) **References Cited**

U.S. PATENT DOCUMENTS

3,928,724 A 12/1975 Andersen et al.
4,083,003 A 4/1978 Haemmig et al.

(Continued)

FOREIGN PATENT DOCUMENTS

CA 2405813 A1 11/2001
DE 19920227 A1 11/2000

(Continued)

OTHER PUBLICATIONS

Translated Office Action Office for Japanese Application No. 2008-516087 dated Sep. 29, 2011.

(Continued)

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(57) **ABSTRACT**

A vehicle communication system facilitates hands-free interaction with a mobile device in a vehicle or elsewhere. Users interact with the system by speaking to it. The system processes text and processes commands. The system supports Bluetooth wireless technology for hands-free use. The system handles telephone calls, email, and SMS text messages. The user can customize the device via a user profile stored on an Internet web server.

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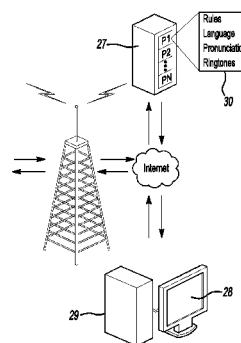
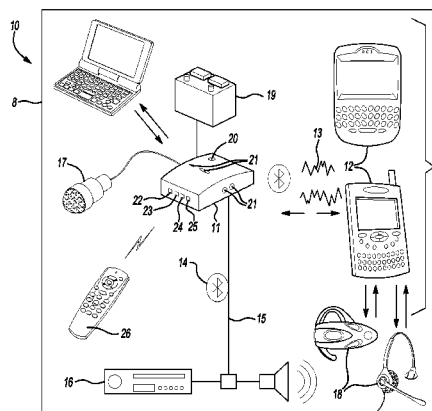
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(56)

References Cited

U.S. PATENT DOCUMENTS

4,532,052	A	7/1985	Weaver et al.	6,972,669	B2	12/2005	Saito et al.
4,591,823	A	5/1986	Horvat	6,982,635	B2	1/2006	Obradovich
4,989,144	A	1/1991	Barnett et al.	7,039,166	B1	5/2006	Peterson et al.
5,177,685	A	1/1993	Davis et al.	7,049,982	B2	5/2006	Sleboda et al.
5,246,073	A	9/1993	Sandiford et al.	7,050,834	B2	5/2006	Harwood et al.
5,488,360	A	1/1996	Ray	7,062,286	B2	6/2006	Grivas et al.
5,638,425	A	6/1997	Meador et al.	7,069,118	B2	6/2006	Coletrane et al.
5,760,742	A	6/1998	Branch et al.	7,085,629	B1	8/2006	Gotou et al.
5,836,392	A	11/1998	Urlwin-Smith	7,091,160	B2	8/2006	Dao et al.
5,912,951	A	6/1999	Checchio et al.	7,113,911	B2	9/2006	Hinde et al.
5,931,907	A	8/1999	Davies et al.	7,117,075	B1	10/2006	Larschan et al.
5,938,706	A	8/1999	Feldman et al.	7,127,271	B1	10/2006	Fujisaki
5,944,783	A	8/1999	Nieten	7,151,997	B2	12/2006	Uhlmann et al.
5,963,618	A	10/1999	Porter	7,191,040	B2	3/2007	Pajakowski et al.
5,983,108	A	11/1999	Kennedy et al.	7,191,059	B2	3/2007	Asahara
6,012,030	A	1/2000	French et al.	7,212,814	B2	5/2007	Wilson et al.
6,041,300	A	3/2000	Ittycheriah et al.	7,228,224	B1	6/2007	Rosen et al.
6,061,718	A	5/2000	Nelson	7,257,426	B1	8/2007	Witkowski et al.
6,088,650	A	7/2000	Schipper et al.	7,280,975	B1	10/2007	Donner
6,147,598	A	11/2000	Murphy et al.	7,286,825	B2	10/2007	Shishido et al.
6,176,315	B1	1/2001	Reddy et al.	7,286,857	B1 *	10/2007	Walker et al. 455/569.2
6,192,364	B1	2/2001	Baclawski	7,289,796	B2	10/2007	Kudoh
6,192,986	B1	2/2001	Urlwin-Smith	7,296,066	B2	11/2007	Lehaff et al.
6,196,317	B1	3/2001	Hardy	7,346,374	B2	3/2008	Witkowski et al.
6,212,474	B1	4/2001	Fowler et al.	7,356,474	B2	4/2008	Kumhyr
6,253,122	B1	6/2001	Razavi et al.	7,363,229	B2	4/2008	Falcon et al.
6,282,495	B1	8/2001	Kirkhart et al.	7,366,795	B2	4/2008	O'Neil et al.
6,295,449	B1	9/2001	Westerlage et al.	7,386,376	B2	6/2008	Basir et al.
6,356,869	B1	3/2002	Chapados et al.	7,400,879	B2	7/2008	Lehaff et al.
6,362,748	B1	3/2002	Huang	7,412,078	B2	8/2008	Kim
6,367,022	B1	4/2002	Gillespie et al.	7,412,328	B2	8/2008	Uhlmann et al.
6,377,825	B1	4/2002	Kennedy et al.	7,426,647	B2	9/2008	Fleck et al.
6,385,202	B1	5/2002	Katseff et al.	7,444,286	B2	10/2008	Roth et al.
6,496,107	B1	12/2002	Himmelstein	7,461,344	B2	12/2008	Young et al.
6,529,863	B1	3/2003	Ball et al.	7,496,514	B2	2/2009	Ross et al.
6,553,102	B1	4/2003	Fogg et al.	7,505,951	B2	3/2009	Thompson et al.
6,574,531	B2	6/2003	Tan et al.	7,526,431	B2	4/2009	Roth et al.
6,580,973	B2	6/2003	Leivian et al.	7,554,435	B2	6/2009	Tengler et al.
6,594,557	B1	7/2003	Stefan et al.	7,567,542	B2	7/2009	Rybak et al.
6,607,035	B1	8/2003	Reddy et al.	7,643,619	B2	1/2010	Jung
6,615,130	B2	9/2003	Myr	7,646,296	B2	1/2010	Ohki
6,622,083	B1	9/2003	Knockeart et al.	7,653,545	B1	1/2010	Starkie
6,650,997	B2	11/2003	Funk	7,689,253	B2	3/2010	Basir
6,690,268	B2	2/2004	Schofield et al.	7,693,720	B2	4/2010	Kennewick et al.
6,697,638	B1	2/2004	Larsson et al.	7,769,364	B2	8/2010	Logan et al.
6,714,223	B2	3/2004	Asami et al.	7,787,907	B2	8/2010	Zeinstra et al.
6,721,633	B2	4/2004	Funk et al.	7,801,283	B2	9/2010	Harwood et al.
6,724,863	B1	4/2004	Bedingfield	7,814,353	B2	10/2010	Naitou et al.
6,731,239	B2	5/2004	Wall et al.	7,859,392	B2	12/2010	McClellan et al.
6,738,742	B2	5/2004	Smith et al.	7,865,309	B2	1/2011	Taylor
6,748,211	B1	6/2004	Isaac et al.	7,881,864	B2	2/2011	Smith
6,764,981	B1	7/2004	Eoff et al.	7,912,186	B2	3/2011	Howell et al.
6,788,935	B1 *	9/2004	McKenna et al. 455/431	7,948,969	B2	5/2011	Boys
6,788,949	B1	9/2004	Bansal	7,983,811	B2	7/2011	Basir et al.
6,812,888	B2	11/2004	Drury et al.	8,015,010	B2	9/2011	Basir
6,812,942	B2	11/2004	Ribak	8,060,285	B2	11/2011	Chigusa
6,839,669	B1	1/2005	Gould et al.	8,090,848	B2	1/2012	Maes et al.
6,842,510	B2	1/2005	Sakamoto	8,195,467	B2	6/2012	Mozer et al.
6,895,084	B1	5/2005	Saylor et al.	8,218,737	B2	7/2012	Odinak
6,895,257	B2	5/2005	Boman et al.	8,289,186	B2	10/2012	Osafune
6,895,310	B1	5/2005	Kolls	8,350,721	B2	1/2013	Carr
6,909,947	B2	6/2005	Douros et al.	2001/0005854	A1	6/2001	Murata et al.
6,925,154	B2	8/2005	Gao et al.	2001/0021640	A1	9/2001	Lappe
6,944,679	B2	9/2005	Parupudi et al.	2001/0056345	A1	12/2001	Guedalia
6,968,272	B2	11/2005	Knockeart et al.	2002/0032042	A1	3/2002	Poplawsky et al.
6,970,703	B2	11/2005	Fuchs et al.	2002/0041659	A1	4/2002	Beswick
6,970,783	B2	11/2005	Knockeart et al.	2002/0090930	A1 *	7/2002	Fujiwara et al. 455/410
				2002/0137505	A1 *	9/2002	Eiche et al. 455/425
				2003/0114202	A1	6/2003	Suh et al.
				2003/0181543	A1	9/2003	Reddy et al.
				2003/0212745	A1 *	11/2003	Caughey 709/206
				2003/0227390	A1	12/2003	Hung et al.
				2003/0231550	A1	12/2003	Macfarlane
				2004/0001575	A1	1/2004	Tang
				2004/0058647	A1 *	3/2004	Zhang et al. 455/41.2
				2004/0082340	A1	4/2004	Eisinger
				2004/0090308	A1 *	5/2004	Takahashi et al. 340/5.72
				2004/0090950	A1	5/2004	Lauber et al.
				2004/0102188	A1 *	5/2004	Boyer et al. 455/422.1

US 9,930,158 B2

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(56)

References Cited

U.S. PATENT DOCUMENTS

2004/0104842 A1 6/2004 Drury et al.
 2004/0116106 A1 6/2004 Shishido et al.
 2004/0119628 A1* 6/2004 Kumazaki et al. 341/176
 2004/0133345 A1 7/2004 Asahara
 2004/0145457 A1 7/2004 Schofield et al.
 2004/0158367 A1 8/2004 Basu et al.
 2004/0182576 A1 9/2004 Reddy et al.
 2004/0185915 A1 9/2004 Ihara et al.
 2004/0193420 A1 9/2004 Kennewick et al.
 2004/0204161 A1* 10/2004 Yamato et al. 455/569.1
 2004/0243406 A1 12/2004 Rinscheid
 2004/0257210 A1 12/2004 Chen et al.
 2005/0046584 A1 3/2005 Breed
 2005/0049781 A1 3/2005 Oesterling
 2005/0054386 A1 3/2005 Chung
 2005/0066207 A1 3/2005 Fleck et al.
 2005/0088320 A1 4/2005 Kovach
 2005/0107132 A1* 5/2005 Kamdar et al. 455/569.2
 2005/0107944 A1 5/2005 Hovestadt et al.
 2005/0130631 A1 6/2005 Maguire et al.
 2005/0131677 A1 6/2005 Assadollahi
 2005/0135573 A1 6/2005 Harwood et al.
 2005/0143134 A1 6/2005 Harwood et al.
 2005/0174217 A1 8/2005 Basir et al.
 2005/0230434 A1 10/2005 Campbell et al.
 2005/0285743 A1 12/2005 Weber
 2005/0288190 A1 12/2005 Dao et al.
 2006/0009885 A1 1/2006 Raines
 2006/0030298 A1 2/2006 Burton et al.
 2006/0052921 A1 3/2006 Bodin et al.
 2006/0055565 A1 3/2006 Kawamata et al.
 2006/0089754 A1 4/2006 Mortenson
 2006/0101311 A1 5/2006 Lipscomb et al.
 2006/0135175 A1* 6/2006 Lundstrom et al. 455/456.1
 2006/0214783 A1 9/2006 Ratnakar
 2006/0217858 A1 9/2006 Peng
 2006/0271275 A1 11/2006 Verma
 2007/0016813 A1 1/2007 Naitou et al.
 2007/0038360 A1 2/2007 Sakhpara
 2007/0042812 A1 2/2007 Basir
 2007/0043574 A1 2/2007 Coffman et al.
 2007/0050108 A1 3/2007 Larschan et al.
 2007/0061401 A1 3/2007 Bodin et al.
 2007/0073812 A1 3/2007 Yamaguchi
 2007/0106739 A1 5/2007 Clark et al.
 2007/0118380 A1 5/2007 Konig
 2007/0162552 A1 7/2007 Shaffer et al.
 2008/0004875 A1 1/2008 Chengalvarayan et al.
 2008/0027643 A1 1/2008 Basir et al.
 2008/0031433 A1 2/2008 Sapp et al.
 2008/0037762 A1* 2/2008 Shaffer et al. 379/265.09
 2008/0071465 A1 3/2008 Chapman et al.
 2008/0119134 A1 5/2008 Rao
 2008/0132270 A1 6/2008 Basir

2008/0133230 A1 6/2008 Herforth
 2008/0140408 A1 6/2008 Basir
 2008/0201135 A1 8/2008 Yano
 2008/0252487 A1 10/2008 McClellan et al.
 2008/0263451 A1 10/2008 Portele et al.
 2008/0270015 A1 10/2008 Ishikawa et al.
 2008/0306740 A1 12/2008 Schuck et al.
 2009/0011799 A1 1/2009 Douthitt et al.
 2009/0099836 A1 4/2009 Jacobsen et al.
 2009/0106036 A1 4/2009 Tamura et al.
 2009/0124272 A1 5/2009 White et al.
 2009/0161841 A1 6/2009 Odinak
 2009/0176522 A1 7/2009 Kowalewski et al.
 2009/0204410 A1 8/2009 Mozer et al.
 2009/0259349 A1 10/2009 Golenski
 2009/0298474 A1 12/2009 George
 2009/0318119 A1 12/2009 Basir et al.
 2010/0023246 A1 1/2010 Zhao et al.
 2010/0036595 A1 2/2010 Coy et al.
 2010/0097239 A1 4/2010 Campbell et al.
 2010/0100307 A1 4/2010 Kim
 2010/0130180 A1 5/2010 Lim
 2010/0137037 A1 6/2010 Basic
 2010/0138140 A1 6/2010 Okuyama
 2010/0159968 A1 6/2010 Ng
 2010/0198428 A1 8/2010 Sultan et al.
 2010/0211301 A1 8/2010 McClellan
 2010/0222939 A1 9/2010 Namburu et al.
 2010/0280884 A1 11/2010 Levine et al.
 2011/0302253 A1 12/2011 Simpson-Anderson et al.

FOREIGN PATENT DOCUMENTS

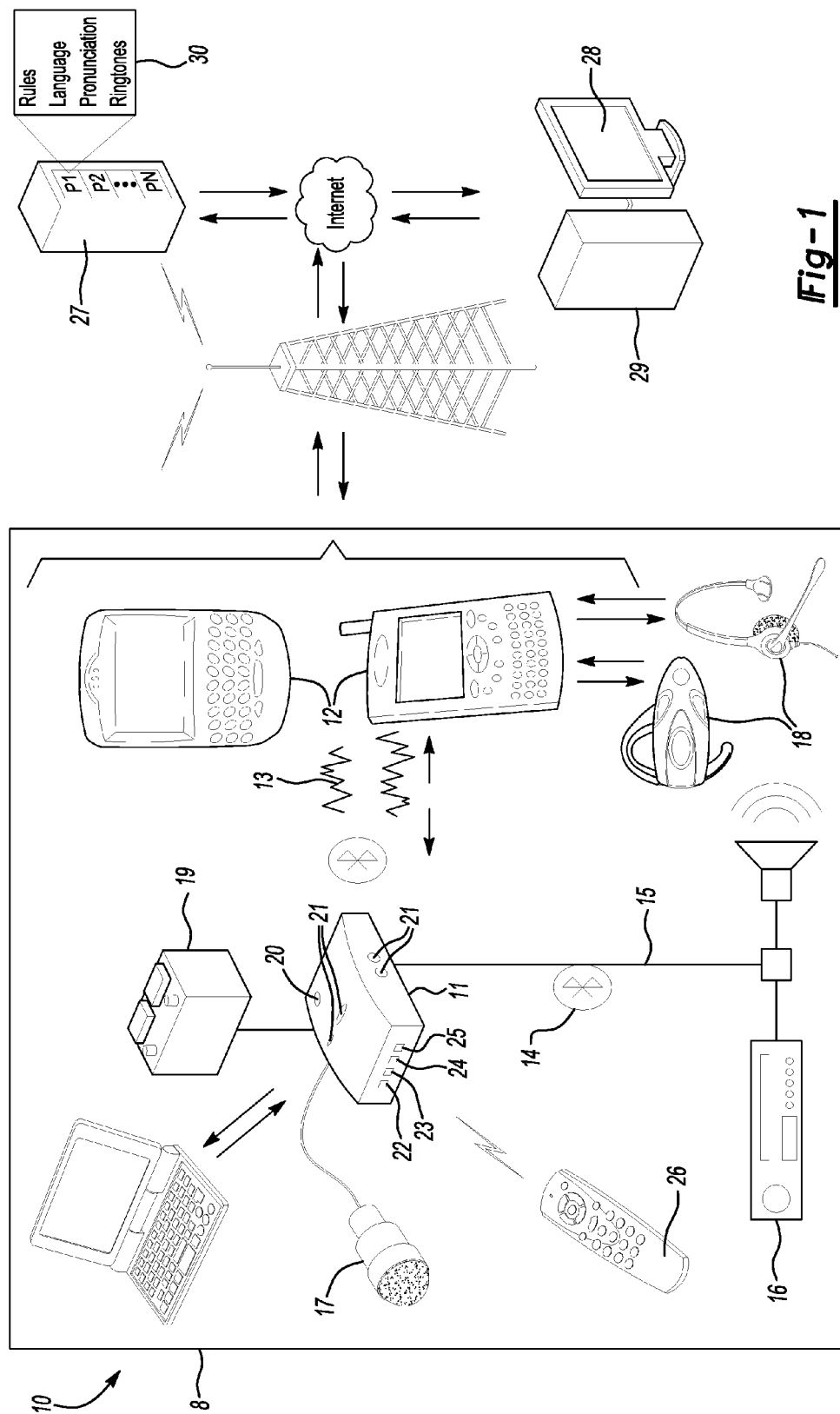
DE 102007062958 A1 6/2009
 EP 901000 B1 3/1999
 EP 1463345 A2 9/2004
 EP 1575225 A2 9/2005
 EP 1568970 B1 12/2006
 EP 1701247 A3 1/2009
 EP 1840523 B1 3/2011
 EP 1986170 B1 4/2011
 GB 2329970 B 11/2001
 GB 2 366 157 2/2002
 JP 2001343979 12/2001
 JP 2002171337 6/2002
 JP 2002176486 6/2002
 JP 2002237869 8/2002
 JP 2004252563 9/2004

OTHER PUBLICATIONS

European Search Report for EP Application No. 06752782.0, dated Mar. 1, 2010.

International Search Report for PCT Application No. PCT/CA2006/000946, dated Nov. 8, 2006.

* cited by examiner



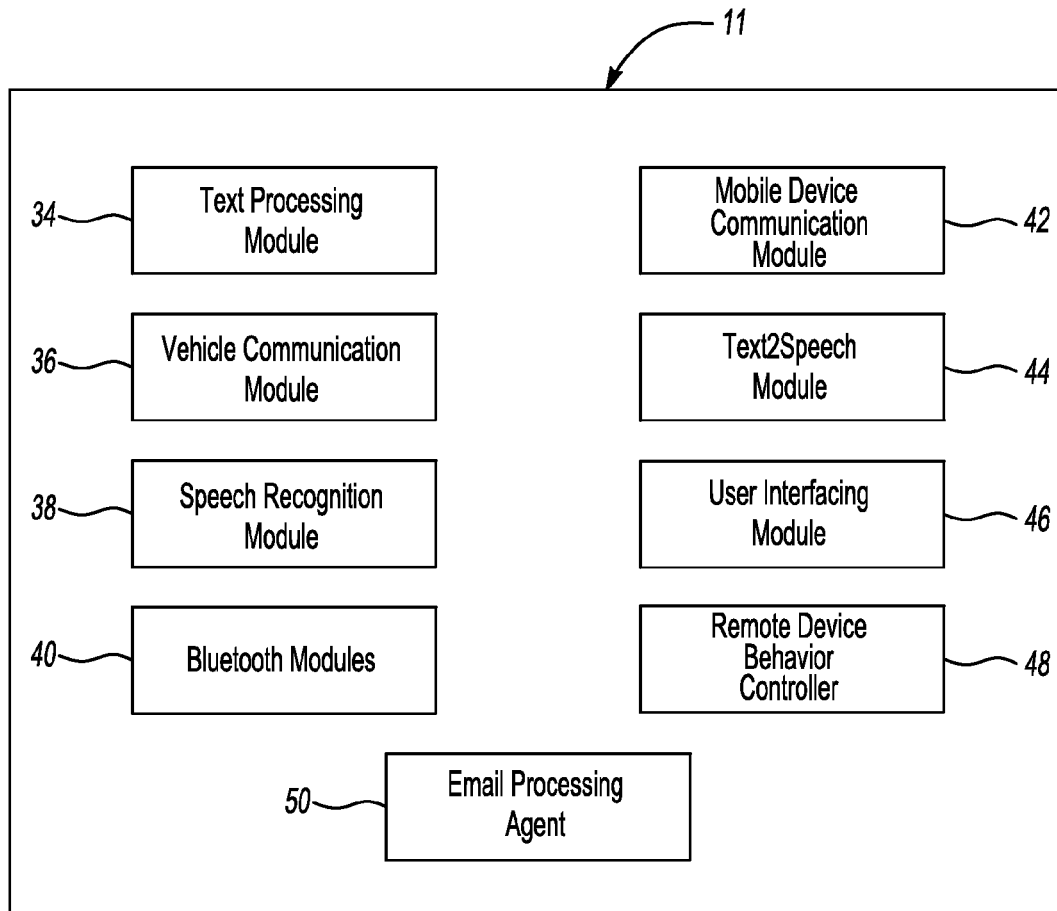


Fig-2

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VEHICLE IMMERSIVE COMMUNICATION
SYSTEM

The application is a continuation of U.S. patent application Ser. No. 11/452,117, filed Jun. 13, 2006, now U.S. Pat. No. 7,689,253 which claimed priority to U.S. Provisional Application Ser. Nos. 60/689,959, filed Jun. 13, 2005; 60/729,905, filed Oct. 25, 2005; 60/736,102, filed Nov. 10, 2005; 60/763,660 filed Jan. 31, 2006; 60/777,424 filed Feb. 28, 2006 and 60/803,329 filed May 26, 2006.

BACKGROUND OF THE INVENTION

This invention relates to a system for managing and communicating information while in a vehicle. More specifically, this invention relates to a system that integrates with a cell phone, PDA, or other mobile device to provide hands-free use of phone call, email, text messaging, and other functionality of a mobile device.

Exchanging critical information using email, instant messaging, and other online media is essential to succeed in today's connected lifestyles and business environments. We depend on constant connectivity for important emails, timely updates, and to make sound decisions. Unfortunately, managing this online information on a mobile device or visible screen can be extremely difficult and dangerous while driving.

In order to address these safety hazards, many states have enacted legislation to restrict the use of cell phones and other mobile devices while in the car. In light of this, hands-free devices for cell phones have become increasingly popular. However, many users are still distracted while trying to drive and operate their wireless devices.

An arrangement for safely managing and communicating a variety of information while in a vehicle is needed.

SUMMARY OF THE INVENTION

This invention addresses this need by providing a convenient and safe hands-free interface to manage important online information while enhancing the driving experience. Rather than awkwardly reaching for a handheld device and looking away from the road to read a new email, this invention integrates seamlessly in a vehicle to read important information out loud, directly to the driver. A voice-based interface provides unified access to all communication needs while allowing the driver to focus their attention on the road.

This invention provides a small device that wirelessly interacts directly with mobile devices and vehicle hands-free audio systems or headsets and allows the driver to listen to and manage email, quickly respond to email over the phone, compose SMS messages, and answer and return phone calls. The driver can talk and listen to it, and remain focused on driving and navigation of the vehicle. A built-in intelligent information manager automatically composes appropriate responses while parsing and prioritizing incoming information to ensure that only the most important messages are heard first.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 schematically illustrates a communication system according to one embodiment of the present invention; and

FIG. 2 illustrates some of the components of the control unit of the communication system of FIG. 1.

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DETAILED DESCRIPTION OF THE
PREFERRED EMBODIMENT

A communication system **10** is shown in FIG. **1** as implemented in a vehicle **8**. The system **10** includes a device control unit **11** which is preferably mounted in a discreet location within the vehicle **8**, such as under the dashboard, in the glove compartment, etc. The control unit **11** supports wireless communication via Bluetooth (IEEE 802.15.1) or any other wireless standard to communicate wirelessly with a cell phone, PDA, or other mobile device **12**. All data **13** is encrypted prior to transmission. The audio output of the control unit **11** is transmitted either wirelessly **14** or through a direct, wired connection **15** to the vehicle's car stereo **16**. The audio input for the control unit **11** is obtained either through a directly connected microphone **17**, through an existing vehicle hands-free system, or wirelessly through a headset **18** connected to the mobile device **12**.

The control unit **11** connects to the vehicle's battery **19** for power. An AC adapter is available for use at home or in the office. For portable use in other vehicles, an optional "Y" or pass-through cable is available to plug into a cigarette lighter accessory socket for power.

The control unit **11** contains a recessed button **20** which enables the driver to do the following: register new or replacement remotes; pair the device with a new mobile device **12**; and clear all preferences and reset the device to its factory default settings. The control unit **11** also has a set of four status lights **21** which display the following information: power and system health, vehicle connection status and activity, mobile device connection status and activity, and information access and general status.

In one example, the control unit **11** and the mobile device **12** recognize when the user, and the user's associated mobile device **12**, are near to, or have entered the vehicle. This may be accomplished, for example, by Bluetooth pairing of the device and the vehicle, or similar wireless communication initiation protocols. Within this range, the handheld device **12** changes from its normal, self-contained operating mode, to an immersive communication mode, where it is operated through the control unit **11**. As will be described in more detail below, among other things, this mode enables the user to hear their emails played through the vehicle's sound system **16**, or, alternatively, and if so equipped, played through the sound system of the mobile device **12**, e.g., headphones **18**. Microphones **17** in the vehicle **8** or on the mobile device **12** detect user-generated voice commands. Thus, the user is not required to change modes on the mobile device **12**; instead, the control unit **11** and associated mobile device **12**, recognize that the user is proximate the vehicle **8** and adjust the mode accordingly.

In addition to adjusting the mode based on vehicle proximity, the system **10** may adjust between a public and a private mode. For instance, as explained above, the system's immersive communication mode ordinarily occurs when the user is proximate the vehicle **8**. The immersive communication mode may have a public setting and a private setting. The public setting plays the emails over headphones **18** associated with the mobile device **12**. Such a setting prevents a user from disturbing other occupants of the vehicle **8**. The private setting plays the emails over the vehicle sound system **16**, and is ordinarily used when the user is the only occupant in the vehicle **8**.

Of course, such system settings may be adjusted by the user and their particular preferences in their user profile. For example, the user may prefer to switch to the immersive communication mode when the mobile device **12** and user

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are within a certain distance from the vehicle **8**, whereas another user may switch modes only when the mobile device **12** and user have entered the vehicle **8**. Further, the user may want to operate the control unit **11** and associated device **12** in a public mode, even if other occupants are in the vehicle **8**.

Similarly, the system **10** recognizes when the user leaves the vehicle **8** and the mobile device **12** reverts to a self-contained (normal) mode. The mobile device **12** may also record the vehicle's location when the user leaves the vehicle **8** (based upon GPS or other information). Accordingly, the user can recall the vehicle position at a later time, either on the device or elsewhere on the system, which may aid the user in locating the vehicle **8**.

The device has multiple USB ports **22**. There are standard USB ports which serve the following functions: to enable the driver to store preferences, settings, and off-line memos and transcriptions on a standard USB flash drive; to permit future expansion, upgrades, and add-on features; and to connect an Ethernet dongle for high-speed internet access. In addition, the control unit **11** has a dual-purpose USB 2.0 port which in addition to the features mentioned above, provides USB 2.0 "on-the-go" functionality by directly connecting to the USB port of a notebook computer with a standard cable (i.e. just like connecting a portable camera or GPS unit directly to a computer).

Other ports on the control unit **11** include an 1/8" audio jack **23** to connect to a car stereo without Bluetooth support, a 1/8" microphone jack **24** to support external high-quality microphones for hands-free calling, and a 1/8" stereo headset jack **25** for use away from the vehicle or in a vehicle without Bluetooth support.

The system **10** also includes an optional remote control **26** to interact with the control unit **11**. The remote control contains lithium batteries, similar to that of a remote keyless entry remote for a common vehicle.

In order to provide security and privacy, the device uses both authentication and encryption. Voice-based biometrics may also be used to further enhance security.

The driver stores his or her settings for the device in their settings profile **30**. This profile **30** may be stored in a database on an Internet server **27**. The control unit **11** utilizes the internet access provided by the driver's mobile device **12** to download the driver's profile **30** via the Internet. The control unit **11** also uses the pairing information from the mobile device **12** to retrieve the correct profile **30** from the server **27**. If the profile **30** has already been downloaded to the control unit **11**, the control unit **11** may just check for changes and updates on the server **27**. Each profile **30** on the server **27** contains a set of rules that the control unit **11** uses to make decisions on content delivery to the driver. The driver can access and modify their profile **30** on the Internet server **27** through either the Internet using a web-based interface **28**, or through a simple interface directly accessible from the associated mobile device **12**. Alternatively, the profile **30** is always stored and modified on the control unit **11** only and can be accessed via the mobile device **12** and/or via a USB connection to a laptop or desktop computer.

As shown in FIG. 2, the control unit **11** includes a text processing module **34**, a vehicle communication module **36**, a speech recognition module **38**, Bluetooth (or other wireless communication) modules **40**, a mobile device communication module **42**, a text-to-speech module **44**, a user interface module **46**, and a remote device behavior controller **48**. The control unit **11** has an email processing agent **50** that processes email messages and determines the identity of the sender, whether the message has an attachment, and if so

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what type of attachment, and then extracts the body-text of the message. The control unit **11** also determines if a message is a reminder, news, or just a regular email message. The control unit **11** uses a data mining algorithm to determine if any parts of the email should be excluded (e.g. a lengthy signature).

Hands-Free Email

One feature of the system is hands-free email. Using the text-to-speech module **44**, the control unit **11** can read email to the driver. When new email arrives, the control unit **11** uses the profile **30** to guide an intelligent filtering and prioritization system which enables the driver to do the following: ensure that emails are filtered and read in order of priority, limit the frequency of new email interruptions, send automatic replies without driver intervention, and forward certain emails to a third-party without interruption. In addition, prior to being read out loud, the control unit **11** processes emails to optimize clarity. Part of that process involves detecting acronyms, symbols, and other more complex structures and ensuring that they can be easily understood when read. The control unit **11** provides intelligent email summarization in order to reduce the time required to hear the important content of email when read out loud.

The driver can interact with the control unit **11** using voice commands, including "go back" and "go forward," to which the control unit **11** responds by going back to the previous phrase or sentence or the next phrase or sentence in the email respectively. In addition, speaking "go back, go back" would back up two phrases or sentences.

Additional hands-free email features include a time-saving filtering system which allows the driver to hear only the most important content or meaning of an email. Another email-related feature is the ability to download custom email parsers to add a new dimension to audible email, and to parse informal email styles (i.e. 18r, ttyl).

The hands-free email functionality includes content-rich notification. When providing notification of a new email, the control unit **11** provides a quick summary about the incoming email, enabling the driver to prioritize which messages are more important. Examples include "You have mail from Sally" (similar to a caller-ID for email), or "You have an important meeting request from Cathy." The control unit **11** looks up the known contact names based upon the sender's email address in the user's address book on the mobile device **12**. The control unit **11** uses known contact names to identify the parties of an email instead of just reading the cryptic email addresses out loud.

In addition to reading email, the control unit **11** also enables the driver to compose responses. The driver can send a reply using existing text or voice templates (i.e. "I'm in the car call me at 'number,'" or "I'm in the car, I will reply as soon as I can"). New emails can also be created and sent as a voice recording in the form of a .wav or .mp3 file. The driver is also provided the option of calling the sender of the email on the phone using existing contact information in the address book, or responding to meeting requests and calendar updates (i.e. Outlook). Emails can also be created as freeform text responses by dictating the contents of the email. The device then translates that into text form for email transmission. An intelligent assistant will be immediately available to suggest possible actions and to provide help as needed. Again all of these options are prompted by verbal inquiries by the control unit **11** which can be selected by voice commands by the driver.

The control unit **11** supports multiple email accounts, and email can be composed from any existing account. Incoming email can also be intelligently handled and prioritized based

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upon account. Optional in-vehicle email addresses on a custom domain are available. Emails sent from this address would include a notification that the email was composed while in transit. When composing an email to an in-vehicle email address, the sender knows that the email will be read out loud in a vehicle. If the traditional email is “george@work.net,” then the in-vehicle address may be “george@driving.net.” Optional enhanced existing email addresses are also available on supported email systems. For example, if the traditional email is “george@work.com,” an enhanced in-vehicle address of “george+driving@work.com” may be selected.

Enhanced Hands-Free Telephone Calls

Another feature of this invention is enhanced hands-free telephone calls. This includes transparent use of any existing hands-free system. All incoming telephone calls can use either the existing vehicle hands-free system or a user headset **18**. If an expected important email arrives while the driver is on the phone, an “email-waiting” indicator (lights and/or subtle tones) will provide subtle notification without disrupting the conversation. A headset **18** can be activated at any time for privacy or to optimize clarity. The control unit **11** will seamlessly switch from the vehicle hands-free system to the private headset **18** for privacy.

The control unit **11** also features enhanced caller-ID. The device announces incoming calls by reading the caller name or number out loud (e.g. “This is a call from John Doe, do you want to answer it?”). This eliminates the need to look away from the road to find out who is calling. Vehicle-aware screening can also automatically forward specific calls to voicemail or to another number when driving, again based upon the driver’s profile. Normal forwarding rules will resume when leaving the vehicle.

The control unit **11** also provides voice activated answering and calling. When the control unit **11** announces a telephone call, the driver can accept the call using a voice command. The driver can use voice commands associated with either contacts in an address book or with spoken phone numbers to place outgoing telephone calls (i.e. “Call Krista”).

Unified Information Management

Another feature of the present invention is that it provides unified information management. The control unit **11** provides a consistent interface for seamless access to incoming and outgoing telephone calls, email, and other sources of information. The existing hands-free interface automatically switches between telephone calls, reading email, and providing important notifications. When entering the vehicle, the control unit **11** automatically provides an enhanced voice-based interface, and when leaving the vehicle, the mobile device **12** automatically resumes normal operation. Email reading can also be paused to accept an incoming phone call, and can be resumed when the call is complete.

In addition, the driver can communicate with any contact through email, a phone call, or an SMS text message simply by speaking. The control unit **11** provides enhanced information for incoming telephone calls. The name and number, if available, are read out loud to ensure that the driver knows the caller without looking away from the road. A nickname, or other information located in an address book, may also be used for notification.

The driver can also reply to an email with a phone call. While reading an email, the driver can contact the sender by placing a telephone call with address book information. When a phone call is made, but the line is busy or no voicemail exists, the user is given the option of sending an

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email to the same contact instead. This eliminates the need to wait and try calling the person again.

Within their profile **30**, the driver can prioritize between email and phone calls, so that an important email will not be interrupted by a less important phone call. In addition, custom mp3 (or other format) ring tones can be associated with both incoming emails and telephone calls. Ring tones can be customized by email from certain contacts, phone calls from certain contacts, or email about certain subjects. Custom “call waiting” audible indicators can be used when an important email arrives while on the phone, or when an important phone call arrives while reading or composing an email.

Enhanced Hands-Free Calendar

Another feature of the present invention is the enhanced hands-free calendar wherein the control unit **11** utilizes the calendar functionality of the user’s mobile device **12**. The control unit **11** reads the subject and time of calendar reminders out loud, and the driver can access additional calendar information with voice commands if desired. The driver can also perform in-transit schedule management by reviewing scheduled appointments (including date, time, subject, location and notes); accepting, declining, or forwarding meeting requests from supported systems (e.g. Outlook); scheduling meetings; and automatically annotating meetings with location information. The driver can also store location-based reminders, which will provide reminders the next time the vehicle is present in a specified geographical area, and automatically receive information associated with nearby landmarks. In addition, the driver could plan and resolve meeting issues by communicating directly with other participants’ location-aware devices.

Do Not Disturb

Another feature of the present invention is the “do not disturb” functionality. When passengers are present in the vehicle, the control unit **11** can be temporarily silenced. Even when silent, the control unit **11** will continue to intelligently handle incoming email, email forwarding, providing automatic email replies, and processing email as desired. A mute feature is also available.

Integrated Voice Memo Pad

Another feature of the present invention is the integrated voice memo pad, which enables the driver to record thoughts and important ideas while driving so they will not be forgotten while parking or searching for a memo pad or device. Memos can be transferred via email to the driver’s inbox, or to any of the driver’s contacts. Memos can also be wirelessly transferred to a computer desktop via the Bluetooth interface as the user arrives in the office, or transferred to a removable USB flash memory drive. Memos can also be annotated automatically using advanced context information including location, weather, and trip information. For example, “this memo was recorded at night in a traffic jam on the highway, halfway between the office and the manufacturing facility.” Such augmented information can provide valuable cues when reviewing memos.

Access to Diverse Information

Another feature of the present invention is the ability to access to diverse information. Information is available in audible form (text-to-speech) from a wide range of sources. First, the control unit **11** provides access to personal connectivity and time management information. This includes email (new and previously read), incoming caller name and number, SMS messages, MMS messages, telephone call logs, address book, calendar and schedule, and instant messages.

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Second, the control unit **11** provides multi-format support. This includes email attachments that can be read out loud, including plain text, audio attachments (i.e. .wav, .mp3), HTML (i.e. encoded emails and web sites), plain text portions of Word and PowerPoint files, Adobe Portable Document format (PDF), OpenDocument formats, and compressed and/or encoded attachments of the above formats (i.e. .zip).

Third, the control unit **11** provides remote access to information. This includes existing news sources (i.e. existing RSS feeds) and supported websites. This also includes subscription to value-added services including: weather, custom alerts (i.e. stock price triggers), traffic conditions, personalized news, e-books (not limited to audio books, but any e-book), personalized audio feeds, and personalized image or video feeds for passengers.

Fourth, the device provides environment and location awareness. This includes current location and navigation information, local weather conditions, vehicle status, and relevant location-specific information (i.e. where is “work”, where is “home?”).

Personalization

Another feature in the present invention is extensive personalization and customization for email handling, email notification, time-sensitive rules, vehicle-aware actions, text-to-speech preferences, and multiple user support.

The email handling settings in the user’s profile **30** allow the driver to use the control unit’s **11** built-in intelligent email parsing and processing. This enables the driver to avoid receiving notification for every trivial incoming email. Some of the intelligent parsing features include automatic replies, forwarding and prioritization based on content and sender, and substitution of difficult phrases (i.e. email addresses and web site URLs) with simple names and words. The driver can also choose to hear only select information when a new email arrives (i.e. just the sender name, or the sender and subject, or a quick summary). Email “ring tones” are also available for incoming emails based on sender or specific keywords. Prepared text or voice replies can be used to send frequently used responses (i.e. “I’m in transit right now”). Some prepared quick-responses may be used to automatically forward an email to a pre-selected recipient such as an administrative assistant. The driver can also set up both email address configuration and multiple email address rules (i.e. use “me@work.com” when replying to emails sent to “me@work.com,” but use “me@mobile.com” when composing new emails).

The driver can also customize notification. This includes prioritizing emails and phone calls based on caller or sender and subject (i.e. never read emails from Ben out loud, or if an email arrives from George, it should be read before others). The driver can also limit the amount of notifications received (i.e. set minimum time between notifications, or maximum number of emails read in a short period of time).

Time-sensitive rules in the profile **30** may include options such as “don’t bother me in the morning,” or “only notify me about incoming email between these hours.” The driver can also configure audible reminder types based on calendar and scheduling items from the mobile device. Vehicle-aware actions are configurable based on the presence of the user in the vehicle. These actions include the content of automatic replies and predefined destinations and rules to automatically forward specific emails to an administrative assistant or other individual. These also include actions to take when multiple Bluetooth enabled mobile devices are present (i.e. switch to silent “do not disturb” mode, or take no action).

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The text-to-speech settings for the device are also configurable. This includes speech characteristics such as speed, voice, and volume. The voice may be set to male or female, and may be set to speak a number of languages, including but not limited to US English, UK English, French, Spanish, German, Italian, Dutch, and Portuguese. A base set of languages will be provided with the device, with alternate languages being available in the future. The driver can set personal preferences for pronunciation of specific words, such as difficult contact names, and specialized acronyms or symbols, such as “H₂O.” By default, most acronyms are spelled out letter by letter (i.e. IMS, USB).

Information about specific words or phrases can be used to enhance both speech recognition performance and text-to-speech performance, and this includes context sensitive shortcuts. For example, nicknames should be expanded into an email address if the driver is dictating an email. In addition, email addresses should be expanded to a common name when found. The driver can also set custom voice prompts or greetings.

The device also features multiple user support, wherein multiple people can share the same device. The device automatically identifies each person by their mobile device **12**, and maintains individual profiles **30** for each driver.

Connectivity

The connectivity functionality of the control unit **11** enables it to function as a hands-free audio system. It interacts with supported Bluetooth hands-free devices, including but not limited to Bluetooth enabled vehicles (HS, HFP, and A2DP), after-market hands-free vehicle products, and supported headsets to provide privacy. For vehicles not containing Bluetooth or other wireless support, the control unit **11** can connect directly to the vehicle’s audio system **16** through a wired connection. Retrofit solutions will also be available for existing vehicles lacking wireless connectivity in the form of an optional after-market Bluetooth kit.

The system **10** may include a remote control **26** for accessing the control unit **11**. Emergency response support is available for direct assistance in emergencies, providing GPS location information if available. The driver could also use the control unit **11** through an advanced wireless audio/visual system, including such features as streaming music and providing image content (i.e. PowerPoint, images attached in emails, slideshows). Integrated steering-wheel column buttons is also an available option.

The control unit **11** can also connect to a computer and external devices. This includes personal computers with Bluetooth to conveniently exchange information over a personal area network (PAN). This also includes GPS devices (with Bluetooth or other wireless or wired connectivity) for location awareness. This also includes storage devices (Bluetooth or other wireless or wired) for personal e-book libraries, or to manage offline content with the unified hands-free interface. An optional cable will be available for controlling an iPod or other music player with voice commands. Through the device’s USB ports, the driver can expand the functionality of the device by attaching such items as a USB GPRS/EDGE/3G device for direct mobile access without a separate mobile device, or a USB WiFi for high-speed Internet access.

Upgradeability and Expansion

The driver may add future enhancements to the control unit **11** wirelessly using standard Bluetooth enabled devices. This includes support for wireless transfer with a desktop or notebook computer to transfer and synchronize information. Advanced Bluetooth profile support (i.e. A2DP) for stereo and high quality audio is also available.

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As mentioned previously, the control unit **11** will contain two USB ports. The standard USB port or ports will provide convenient access to standard USB devices for storing preferences on a standard USB flash drive; storing and moving off-line memos and transcriptions recorded by the device; and future expansion, upgrades, and add-on features. The dual-purpose USB 2.0 "On-The-Go" port or ports will provide both the aforementioned features to access USB devices, and also direct connections to a computer with a standard cable (i.e. just like connecting a digital camera or GPS unit directly to a computer).

In accordance with the provisions of the patent statutes and jurisprudence, exemplary configurations described above are considered to represent a preferred embodiment of the invention. However, it should be noted that the invention can be practiced otherwise than as specifically illustrated and described without departing from its spirit or scope.

What is claimed is:

1. A method for providing communication in a vehicle including the steps of:

- a) determining that a mobile device is in a vehicle via a wireless connection to the mobile device, wherein the mobile device is a cell phone;
- b) identifying the mobile device via the wireless connection to the mobile device;
- c) identifying a user profile associated with the mobile device based upon the identification of the mobile device in said step b); and
- d) processing a non-voice message received by the mobile device based upon said step c), including the step of redirecting the message intended for the user to a control unit in the vehicle over a wireless communication link based upon the identification of the user in said step c).

2. The method of claim **1** wherein said step d) includes the step of forwarding the message based upon the user profile.

3. The method of claim **2** wherein the step of forwarding includes the step of forwarding the message to a different user.

4. The method of claim **2** further including the step of processing a telephone call to the mobile device based upon the user profile.

5. The method of claim **1** wherein the message includes at least one of an email message, an SMS or text message or a MMS message.

6. The method of claim **1** wherein the mobile device is the user's mobile device, the method further including the step of:

- e) detecting the presence of a mobile device other than the user's mobile device;
- wherein said step d) includes processing the message based upon the presence of the mobile device other than the user's mobile device.

7. The method of claim **6** wherein the user's mobile device is a first user's mobile device and wherein the mobile device other than the user's mobile device is a second user's mobile device, the method further including the steps of:

- f) identifying the second user's mobile device;
- g) identifying the second user associated with the second user's mobile device

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- h) maintaining a first profile associated with the first user and a second profile associated with the second user.

8. The method of claim **1** wherein said step c) includes the step of selecting the user profile associated with the mobile device from among a plurality of user profiles.

9. The method of claim **1** wherein the message is an email message.

10. The method of claim **1** wherein the communication is an email message.

11. A method for providing communication in a vehicle including the steps of:

- a) determining that a mobile device is in a vehicle, wherein the mobile device is a cell phone;
- b) identifying the mobile device via a wireless connection to the mobile device;
- c) identifying a user profile associated with the mobile device in response to the identification of the mobile device in said step b);
- d) redirecting a first email message received on the mobile device to a control unit in the vehicle over a wireless connection based upon the determination in said step a) that the mobile device is in the vehicle and based upon the user profile identified in said step c);
- e) converting the first email message to speech and playing the speech audibly in the vehicle;
- f) receiving a second email message on the cell phone; and
- g) automatically forwarding the second email message based upon the user profile.

12. A method for providing communication in a vehicle including the steps of:

- a) determining that a mobile device is in a vehicle, wherein the mobile device is a cell phone;
- b) identifying the mobile device via a wireless connection to the mobile device;
- c) identifying a user profile associated with the mobile device in response to the identification of the mobile device in said step b);
- d) processing an email message received on the mobile device based upon the user profile identified in said step c), wherein the email message in said step d) is one of a plurality of email messages, said step d) including the step of processing the plurality of email messages including filtering the plurality of email messages based upon the user profile identified in said step c), wherein said step d) further includes the step of redirecting the message intended for the user to a control unit in the vehicle over a wireless communication link based upon the identification of the user in said step c); and
- e) based upon the user profile and based upon the filtering in said step d), converting at least one of the plurality of email messages to speech and playing the speech audibly in the vehicle.

13. The method of claim **12** wherein the step of processing the plurality of email messages including prioritizing the plurality of email messages based upon the user profile identified in said step c), wherein the step of playing the speech is based upon the prioritization.

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